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CLAIMS:

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4. 1. A method for converting heat into mechanical work, in
5 which a working medium is compressed in a cyclic process
6 while giving off heat and is subsequently brought in thermal
7 contact with the ambient environment via a first heat
8 exchanger (16), is then expanded while obtaining mechanical
9 work, whereupon the cyclic process is run through again,
10 characterized in that the working medium, after expansion, is
11 guided through another heat exchanger (18) which is situated
12 inside a rapidly rotating rotor (13) and which, on the
13 exterior thereof, is surrounded by at least one essentially
14 annular gas chamber (17a, 17b, 17c, 17d) from whose exterior
15 heat is dissipated.

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17. 2. A method according to claim 1, characterized in that the
18 working medium is guided downstream of the rotor (13) through
19 a compressor.

20

21. 3. A method according to claim 1 or 2, characterized in that
22 the working medium takes up ambient heat in the first heat
23 exchanger (16).

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25. 4. A method according to one of the claims 1 to 3,
26 characterized in that the working medium is guided
27 essentially in the axial direction through the rotor (13).

28

29. 5. A method according to one of the claims 1 to 4,
30 characterized in that a temperature difference is built up in
31 the rotor (13) of at least 100 K, preferably of at least 300
32 K and more preferably of at least 500 K.

33

1 6. A method according to one of the claims 1 to 5,
2 characterized in that heat is dissipated via cooling ribs on
3 the outside of the rotor (13).

4
5 7. A method according to one of the claims 1 to 5,
6 characterized in that heat is dissipated via a third heat
7 exchanger (19) on the outside of the rotor (13).

8
9 8. An apparatus for converting heat into mechanical work,
10 comprising a rotor (13) with a heat exchanger (18) which can
11 be flowed through substantially in the axial direction and
12 which is delimited on its outside by a cylindrical wall, on
13 the outside of which there is provided at least one
14 substantially annular gas chamber (17a, 17b, 17c, 17d),
15 characterized in that the heat exchanger (18) is provided
16 with a substantially ring-cylindrical configuration, and that
17 the gas chamber (17a, 17b, 17c, 17d) is subdivided in the
18 radial direction into several ring-cylindrical partial
19 chambers (17a, 17b, 17c, 17d).

20
21 9. An apparatus according to claim 8, characterized in that
22 different gases are received in the individual partial
23 chambers (17a, 17b, 17c, 17d).

24
25 10. An apparatus according to one of the claims 8 or 9,
26 characterized in that a pressure control device is provided
27 which is in connection with the ring-cylindrical partial
28 chambers (17a, 17b, 17c, 17d) in order to set the internal
29 pressure.

30
31 11. An apparatus according to claim 10, characterized in
32 that the pressure control device is provided in the region of
33 the axis of the rotor (13).

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1 12. An apparatus according to one of the claims 8 to 11,
2 characterized in that the ring-cylindrical partial chambers
3 (17a, 17b, 17c, 17d) is separated from one another by
4 cylindrical separating walls.

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6 13. An apparatus according to one of the claims 8 to 12,
7 characterized in that the feeding and discharging of the
8 working medium occurs through the shafts (22, 26) of the
9 rotor (13).

10

11 14. An apparatus according to one of the claims 8 to 13,
12 characterized in that the rotor (13) is held in a housing
13 (28) which comprises magnets (29) which exert an inwardly
14 directed magnetic force on the circumference of the rotor.

15

16 15. An apparatus according to one of the claims 8 to 14,
17 characterized in that the gas chamber (17a, 17b, 17c, 17d) is
18 subdivided in the radial direction into at least three,
19 preferably at least four ring-cylindrical partial chambers
20 (17a, 17b, 17c, 17d).